# COAL MINING

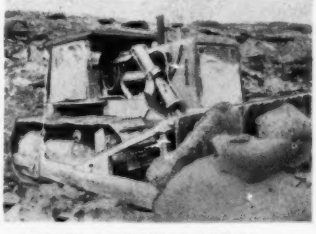
JULY, 1952 — published by Modern Mining Publishing Co. 6401 CLAIRTON BLVD. • PITTSBURGH, PA. — VOLUME 29, No. 7

**big JOBS to Do**

**right equipment to do them!**

ROBERT BAILEY, Morrisdale . . . Lima 2400 Dragline.

RIVER HILL COAL CO., Keewaydin . . . Allis-Chalmers HD-20 with Baker Hydraulic Bulldozer.



SWANEY & MOATS, Smithfield . . . Allis-Chalmers HD-20 with Baker Hydraulic Bulldozer.

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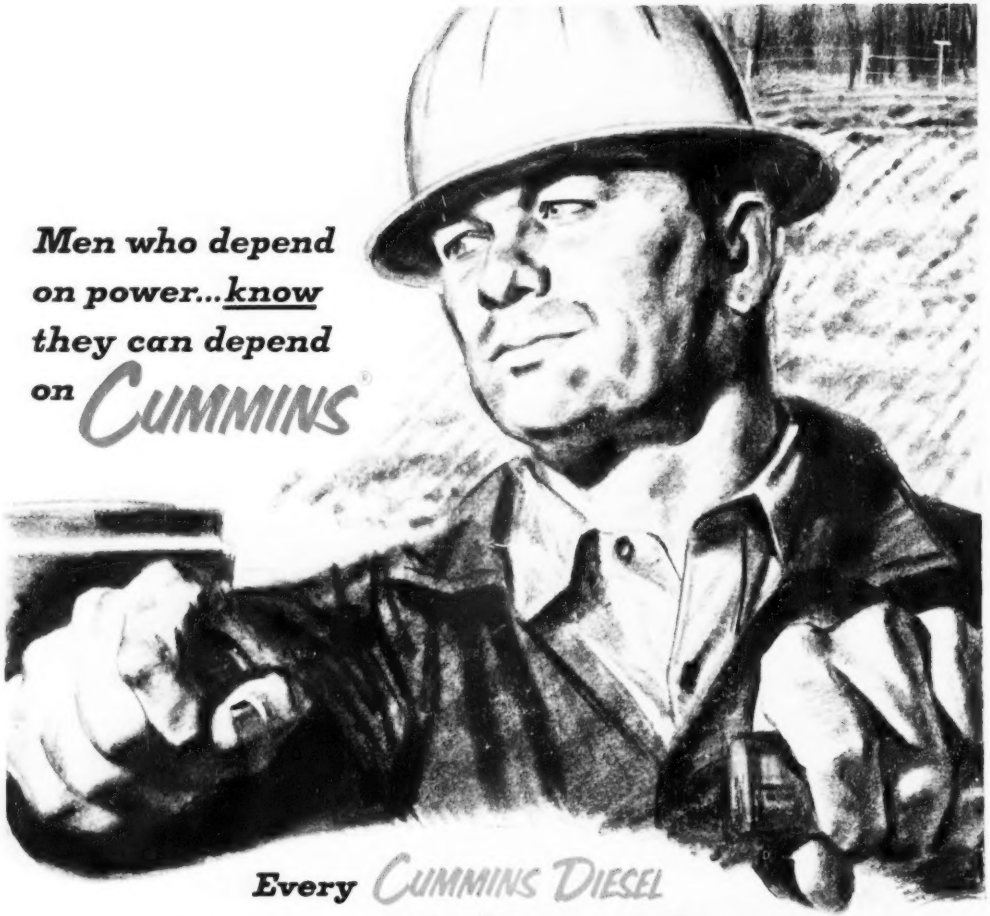

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Miners have learned to count on Cummins Diesels for dependable power day in, day out. What's behind this consistent reliability? One good reason is the fact that every Cummins Diesel is actually built *twice*. After initial assembly, and run-in testing, every engine is disassembled, inspected; then reassembled and tested again.

This extra care—together with Cummins' economy-proved fuel system and efficient parts and service organization—makes lightweight, high-speed (50-550 h.p.) Cummins Diesels a wise first choice *for men who depend on power.*

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(3-20-52)

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Extra heavy-duty units compactly designed bore blast holes faster with less effort because of greater power and finger-tip hydraulic feed.

Choice of gasoline, diesel or electric power units drive interlocking-auger sections to any required depths through shale, sandrock, soft limestone and other earth formations.

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Write now for full information on how these rugged work horses can help you hit pay dirt faster.

### COAL RECOVERY DRILLS

McCarthy Coal Drills bite into the seam's heart to pull out clean, valuable lump or slack coal with minimum effort, minimum cost.

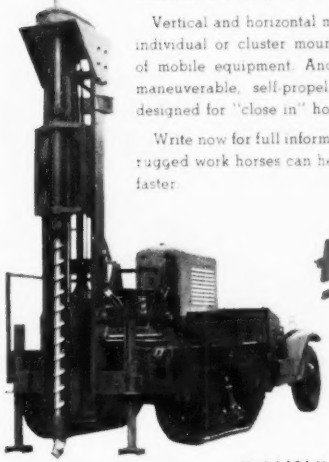
Near Salineville, Ohio three men use one machine with 24-inch diameter augers to produce 90 tons of coal daily. At Germano, Ohio the same number of men use 36-inch diameter augers to produce 167 tons per day!

The rugged McCarthy Mineral Recovery Drills produce coal at $1.50 to $2.00 per ton, including amortization of investment cost. These hydraulically controlled units operate on gasoline, diesel or electric power.

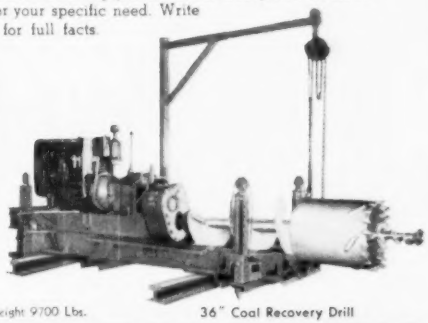
Choose from 4 models. 4 to 24-ft. interlocking-auger sections are available in 20, 24, 30, 36, 42 and 48-inch diameters. Jacks are power operated.

McCarthy dealers can show you many testimonials of installations and help you make the most profitable selection for your specific need. Write today for full facts.

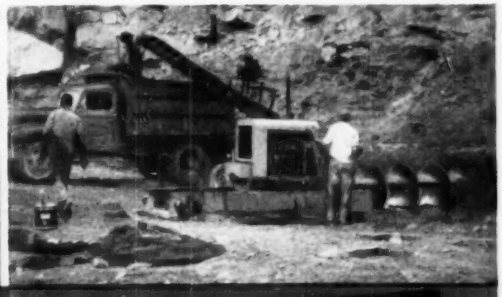
*Heavy Rugged Powerful*



Model 106 Vertical Drill



Weight 9700 Lbs. 36" Coal Recovery Drill



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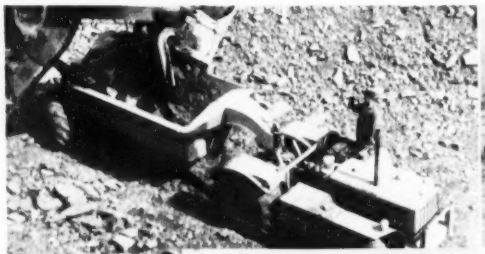
# SHORTEN LONG HAULS . . .

## LENGTHEN SHORT PROFITS

M. H. Bigan, Windber, Pa., does a fast stripping job with DW20's equipped with 20-yard No. 20 Scrapers. 100% "Cat"-built from bumper to push-plate, they're backed by Beckwith Service!



Keelor Construction Co., Perkiomenville, Pa., hauls tough shale for road construction with an 11-yard DW10–No. 10 team. The 115 h.p. DW10 is the veteran earthmover of the "Cat" line.

Allegheny Asphalt & Paving Co., Inc., loads a DW21 Tractor–No. 21 Scraper with the aid of a D8 push-tractor on a new air base. The big load will roll at 20 m.p.h. behind the powerful DW21.

Rochez Brothers, Inc., moves earth at an army depot with "Cat" DW21 Tractor–No. 21 Scraper teams. The 20-yard earthmover is powered with a 275 h.p. (ASME rating) "Cat" Diesel.

Ruth Construction Co., Scottdale, Pa., hauls 25 heaped yards in a W20 Wagon working with a 275 h.p. (ASME) DW20 Tractor. The bottom-dump wagon is hydraulically controlled.

# WITH "CAT" HIGH-SPEED

# EARTHMOVERS

## FROM BECKWITH

■ Dirt-hungry "Caterpillar" Diesel Rubber-tired Earthmovers can run the mile in three minutes—with a heaped load of dirt, rock, coal or what have you. They've got the power for such speed runs and a safety factor that lets you use it . . . plus the traction to walk in—and out—of spots where other units will mire down.

On the profit side of the ledger, "Cat" DW Earthmovers have an engine with a reputation for lowest operating costs—an engine that provides lugging and long idling ability not present in other automotive-type diesel engines. Repairs are few and far between . . . a long life expectancy keeps depreciation way down.

With prompt Beckwith Service near at hand, lengthy downtime is a thing of the past. Most parts are in our stock for immediate delivery.

We can show you how "Cat" DW20's, DW21's or DW10's are built . . . how they work . . . how they can do your job better at a profit. Give us a call and we'll show you how fast we are!

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# Can your rear-dump

Stripping bauxite in Surinam, Billiton Mines replaced their railroad network with 9 Tournarockers. In spite of 10% grades, extreme heat, and 120" annual rainfall, each unit delivers 150 cu. yds. of overburden hourly on 750' hauls.

## *Here's how* these advantages pay off

### Try one, buy two in California

Monolith Portland Cement Co. rented a Tournarocker for their mountain-face limestone quarry at Monolith. Its maneuverability over winding mountain roads, in restricted load and dump areas, and its output were so satisfactory the company bought *both* the first unit *and* another. The 2 Tournarockers now deliver 160 tons hourly on 400' cycles, all the shovel can dig.

### Boosts output in Pennsylvania

Loaded with 15 yds. of clay, Tournarocker hauls 700' up 10% grades, 820' up 4%... strips 120 yards hourly for J. Robert Baxley, Inc. at their Mt. Carmel, Pa., mine. 4200' cycle is completed in 7.4 min. . . . smaller trucks take 7.9 min. for same trip. "We're particularly impressed with Tournarocker's clean dump and its safety when rear wheels are over bank," says Owner Baxley.

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# haulers compare with C TOURNAROCKERS ?

### Turn around in a 13′ 9″ radius

When Tournarockers work a cramped rock job, there's no time wasted "backing all over the place" to load or dump. Because of its 2-wheel prime mover and positive-power electric steer, 18-ton Tournarocker turns in any footing within 13′ 9″ radius (less than half the rig's 29′ overall length), is ideal unit for work in restrictive quarters.

### Eliminate tire breakage in rough going

Tournarocker load is carried by four 21.00 x 25 low-pressure tires. These big tires reduce rolling resistance of duals . . . are bigger, heavier, stronger than duals . . . better adapted to withstand load and haul shocks. They have no divided face to wedge in rock fragments that wear and tear. They roll easily over rocks that might concentrate entire load on one or the other of the lighter duals, and result in bruising or breaking the fabric.

### Absorb punishment without costly repairs

Tournarocker's 3-ply, steel-grid bowl resists damage normally done when big-chunk rock is loaded. As a result, most welding and patching is eliminated. In addition, because Tournarockers have no frame, sub-frame, springs, spring hangers, drive shaft, front steering wheels or hydraulic system, many trouble spots are eliminated . . . spare part requirements reduced . . . maintenance costs kept down.

### Work and turn on steep grades in safety

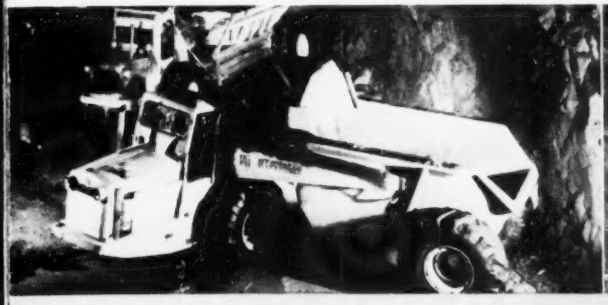
With positive power steer, and instant electric controls, and 4-wheel, multiple-disc air brakes (3763 sq. in. total braking surface, more than 4 times that of other haulers), loaded Tournarocker may be driven at high speeds down narrow, steep winding haul roads with complete safety.

### Drive anywhere . . . dump safely over bank

Power-proportioning differential (which delivers up to 4 times the power to drive wheel on firmest footing) — plus the extra flotation and traction of giant tires — get rig through footing that stops conventional haulers. In addition, because it has power on front wheels, Tournarocker backs safely to edge of fill, dumps load clear over bank . . . eliminates most dozer clean-up.

### Interchangeable for further profits

For other jobs, you can easily interchange the 186 h.p. C Tournarocker prime mover with 4 auxiliary hauled units . . . 16 yd. Carryall Scraper, 18-yd. bottom-dump hauler, flat-bed, and 15-ton crane. Other Tournarockers (9, 35 and 50-ton) may also be interchanged with similar trailing units, each costing about 25% of original unit price. Prime mover change takes only a few hours. This equipment travels via highway or cross-country to their assignments. Ask your LeTourneau dealer for full details.



Carryall—Trademark Reg. U. S. Pat. Off.
Tournarocker—Trademark E156m

### Whips tight quarters in Sweden

**Svenska Vag Akt. and Nya Asfalt Akt. are nearing completion of a 785,000-yd. 36′ wide, 40′ high, and 2.9-mi. long underground tail-race tunnel in Gavleborgs Province. "Our Tournarocker is superior to other units," says Chief Project Engineer S. Westby. "Its greatest advantage is its maneuverability and 13′ 9″ turning radius."**

### Licks 10% grades in Arizona

**Two 35-ton Tournarockers, stripping overburden for Bagdad Copper Corporation at Bagdad, Arizona haul loads, which by actual weight tests, average 37½ tons each. Time for each 4500′ cycle—including 2 min. to load, and 4½ min. to haul 2250′ (half of the distance up 10% grades) averages only 11.2 minutes. Dump time varies from 35 to 40 seconds.**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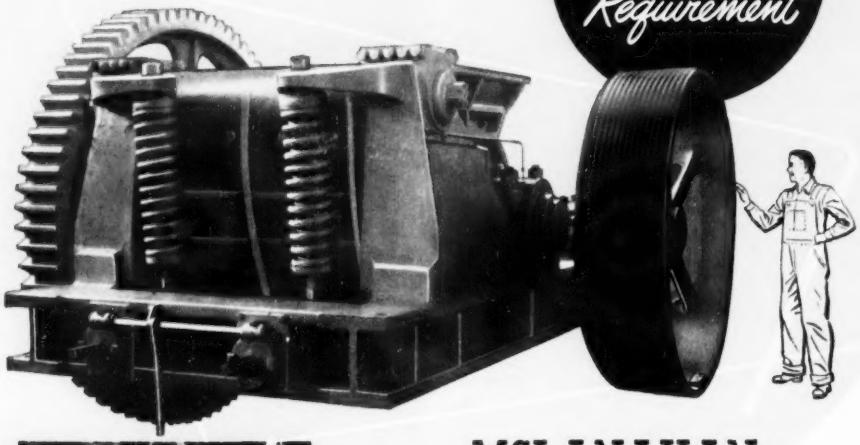

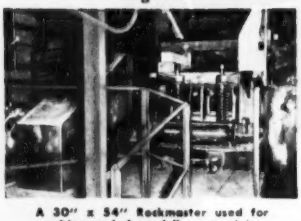

A 30" x 54" Rockmaster used for crushing rock from full seam mining.

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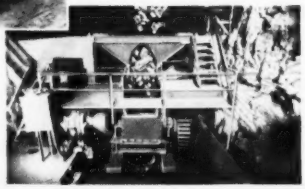
*Single Roll*
# ROCKMASTER CRUSHER

Outstanding for both primary and secondary crushing, the Rockmaster produces a minimum of flats, dust and irregular sizes. Self-feeding and equipped with automatic tramp iron protection and quick adjustment, it will take a choke feed without jamming. In operation, the material is held against the crushing plate while it is sledged by the wedge-shaped teeth of the roll until broken and forced through the crusher opening. Interchangeable and reversible crushing plates and quick-change steel segment rolls contribute greatly to economy in maintenance. The Rockmaster has been thoroughly service-proved on limestone, iron and manganese ores, gypsum, rock, gravel, shale, slag and other materials.

A 60" McLanahan reciprocating feeder delivering limestone from 10 yard dragline to a 36" x 60" Rockmaster in a quarry in northwestern Ohio.



In both primary and secondary crushing the Rockmaster gives a minimum of fines and flats in this Iowa mine.

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Hollidaysburg, Pennsylvania

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This 8-page bulletin includes dimensional drawings, capacity and horsepower data and technical details.

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## OFF-THE-HIGHWAY HAULING EQUIPMENT

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Heavy-duty design and construction throughout assure long life and dependable performance . . . more loads per hour and more profit per load on the toughest jobs. Some of the Euclid-built features are the planetary type drive axle, frame and body on all models, and double-acting hydraulic hoist for Rear-Dump and Side-Dump "Eucs".

Owners can depend on Euclid's world-wide distributor organization for parts and service when and where they are needed. Call or write your Euclid Distributor for complete information on models best suited for your job requirements.

**The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio**

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the Earth

# COAL MINING

Vol. XXIX July, 1952 No. 7


## Contents


Do You Know ..... 9

Here and There in the Coal Industry ..... 9

Conveyor Belt Cartage ..... 12

Meetings of the Western Pennsylvania Coal Operators Association ..... 14

Coal Strippers Meet ..... 18-19

Ohio Branch of the Mining Electro-Mechanical Maintenance Association Is Organized ..... 20

Advertiser's Index ..... 27



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## Do You Know?

• An improved method of turning coal into gas without removing the coal from the ground has been invented by Louis L. Newman, Washington, D. C., and Wilburn C. Schroeder, Clinton, Md. They have assigned their patent to the Department of the Interior.

The Department has been carrying on extensive experiments with the hope of discovering a practical method of accomplishing this purpose.

They have received patent number 2,593,477 for their invention.

Drawbacks in previous methods of burning coal underground to extract the gases, according to the patent, were that the coal was not always entirely consumed and that the gases themselves sometimes caught fire before they could be brought above ground.

The inventors claim they get around these two difficulties by drilling holes into the coal seam, the holes being in rows. The air, or other oxygen-containing gas needed to support the burning of the coal, is fed into the coal seam through one row of holes, while the resulting gases are drawn off in the second row.

Other smaller holes are drilled in between the rows. When the gases catch fire, non-burning sealing materials can be pumped into these intermediate holes to seal the gases off from the oxygen and the fire.

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• Toledo, Ohio, — Concrete slabs with center layers of glass fiber, already in experimental use, are designed to lessen the cost of masonry construction and provide an insulating sandwich wall for commercial, industrial and residential use.

The slabs are factory-made. They are shipped to the job after a 12-day curing period ready for installation. They are five inches in thickness and are made in sizes from eight-by-eight feet to eight-by-30 feet. Edges of the standard panels are tongue and grooved on all four sides to produce an interlocking joint. One side has a facing of muslin cloth, the other a rough broom finish.

The slabs are cast in a flat position with the muslin on the bottom form plate. A concrete mixture and wire mesh are placed on this. Over it is put a layer of pre-formed glass fiber and another layer of concrete. After setting the slabs are cured for two days in a chamber at 120-degree temperature and 100 per cent humidity. Then they are further cured in the factory yard for ten days.

These slabs can be used as a curtain wall to be attached to structural iron or as a load-bearing wall. Owens-Corning Fiberglas Corporation here, whose product is used for the center layer, states this new sandwich wall is meeting with great favor among builders because of the speed with which it can be erected. It saves up to 40 per cent in masonry cost, it is claimed, and is highly durable because of less joints. Because it is insulating, it reduces heating costs in winter and helps keep out the heat of the hot summer sun.

# Here and There in the Coal Industry

• Charles E. Walker has been elected executive vice-president of Jewell Ridge Coal Corporation, effective June 1, 1952. Huston St. Clair, president of Jewell Ridge, made the announcement following the annual meeting of stockholders of the corporation.

Mr. Walker, formerly general manager of operations of Pond Creek Pocahontas Co. and Island Creek Coal Co., and most recently manager of West Virginia operations of Truax-Traer Coal Co., will maintain his home and office headquarters at Tazewell, Va.

Jewell Ridge operates properties in Virginia, Tennessee, the Hazard Field of Kentucky, and the Logan Field of West Virginia.

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• Wm. Ritter died at his home in Washington, D. C. He was a pioneer coal and lumber man being head of the Red Jacket Coal Corp. and the Ritter Lumber Company of Columbus, Ohio for many years. He was 88 years of age.

---

• Seth T. Reese, of the Bureau of Mines Health and Safety Division, has been named Chief of the Accident Analysis Branch of the Bureau succeeding Forrest T. Moyer, who transferred to the Central Intelligence Agency. Reese, a native of Pennsylvania, has been with the Bureau of Mines since 1942.

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• The West Kentucky Coal Co., Madisonville, Ky., announced the election of James R. Love as a vice president of that corporation and vice president and general manager of the St. Bernard Coal Co., a West Kentucky subsidiary.

Mr. Love is the son of Hooper Love, president of the West Kentucky Coal Co. He is the fourth generation of the Love family to engage in the coal business.

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• The Sixtieth Annual Meeting of the Illinois Mining Institute will be held at the Abraham Lincoln Hotel, Springfield, Illinois, on October 24.

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• George D. Wyant, superintendant of the Indianola mine Republic Steel Corporation died. Funeral services were held at Uniontown, Pa.

• At the annual May meeting of the Central Advisory Council of The Mining Electro-Mechanical Maintenance Association, held in the Bureau of Mines Building, 4800 Forbes Street, Pittsburgh, May 23, the following officers were elected:

President A. E. Molinski, Maintenance Superintendent, Bethlehem Collieries Corporation, Johnstown, Pa., Vice President, F. J. Bucher, Electrical Engineer, Hillman Coal and Coke Company, Pittsburgh, Pa.; C. L. Brown, Electro-Mechanical Department, Bureau of Mines, Pittsburgh, was appointed Secretary-Treasurer.

Donald J. Baker, Manufacturer's Representative, Pittsburgh, and retiring president was elected to the Executive Committee. Other associate members elected to the same committee were: D. C. Jones, Director of Mining Extension, State College and A. E. Rankin, Goodman Manufacturing Company, Pittsburgh.

Branch representatives elected to the Executive Committee were: George Truby, Maintenance Superintendent, Allegheny - Pittsburgh Coal Company, New Kensington, Donald Wiebe, Mining Instructor, W. Virginia University, Morgantown and Stephen McCann, Maintenance Department, Crucible Steel Mines, Crucible, Pa.

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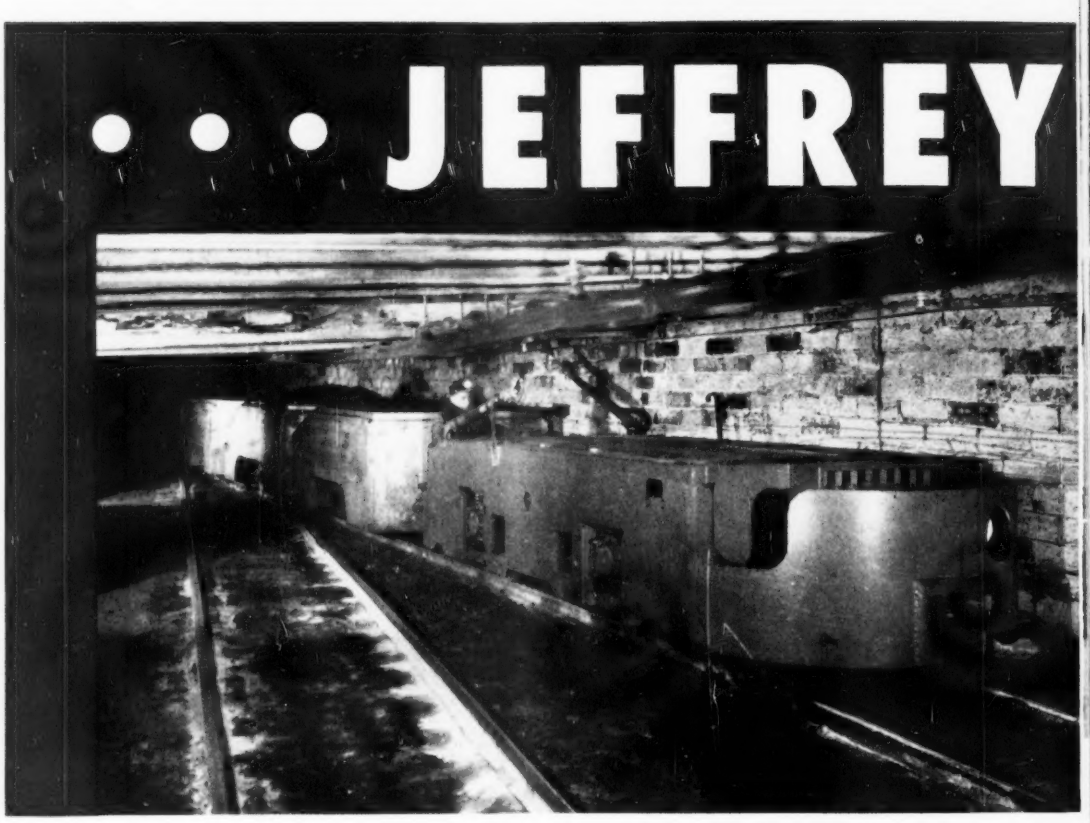
• Earl R. Maize, for the past four and one-half years head of the NCA's Safety Division, is now General Manager of Operations for the Sheridan-Wyoming Coal Co., at Monarch, Wyo.

Mr. Maize came to the National from the Bureau of Mines, where for twenty years he supervised safety work, research and did recovery work following mine fires and explosions. Prior to joining the Bureau, Mr. Maize was engaged in practical coal mine operations in the coke regions of Pennsylvania. He is a graduate of Pennsylvania State College with a degree in Coal Mine Engineering.

Mr. Maize and his family will make their home in Sheridan, Wyo. His headquarters will be in Monarch, from which point he will supervise the operations of the company's five mines in Montana, Wyoming and Colorado.




● From the days of hand loading direct into small mine cars Jeffrey Locomotives have been in constant use as power units under widely divergent conditions.

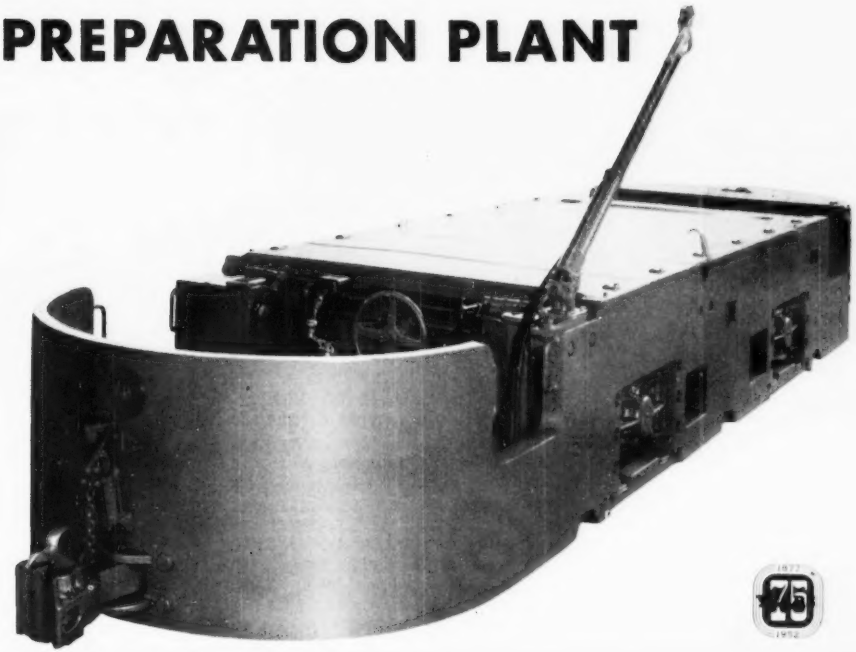
Today wherever coal haulage is maintained by rail Jeffrey provides modern locomotives to meet every haulage condition.

Jeffrey Locomotives are available for main and gathering service in all types—battery—cable reel—trolley and in various combinations to fit your operation. They can be single units or tandem —four wheel drive or the new eight-wheel, high speed units.

Consult a Jeffrey Engineer on your transportation system for greater production and lower per ton costs.

# LOCOMOTIVES

## DEPENDABLE HAULAGE FROM FACE TO PREPARATION PLANT



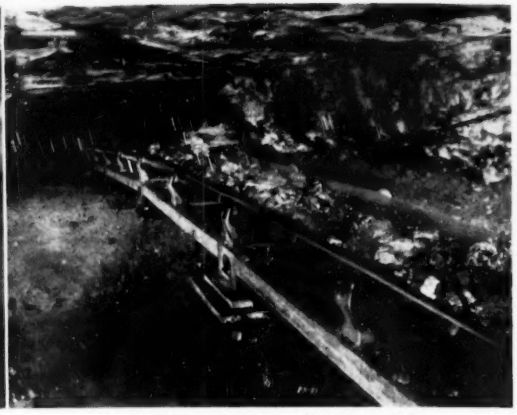
1877 75 1952

# JEFFREY

Established 1877

Complete line of Material Handling, Processing and Mining Equipment

52B Jeffrey Belt Conveyor



Another View of Jeffrey Main Line Belt.

# Conveyor Belt Cartage

Conveyor Belts, up to ten miles in length, are providing the cheapest form of transportation of earth, coal and ore. These Rubber-Covered Cotton Duck Belts, in one-yard widths, can deliver 600 tons of coal an hour when run at a speed of 450 feet per minute.

The endless conveyor belt as a cargo carrier is not new but improved belting and installation equipment of the past decade is bringing it into wider use and it is now being successfully used in transporting earth, crushed rock, coal and similar materials over distances as great as ten miles.

These "long-haul" conveyor belts are in competition with roadway trucks and what railroads regard as short hauls. But they are doing the jobs with a high degree of efficiency and at a lower cost than other carriers. Longer belt lines may be expected. One now proposed would carry iron ore and coal a distance of over 100 miles. The railroads with which it would compete do not like the idea and are reported to be trying to prevent its construction. Another belt is proposed to carry subway passengers on a shuttle route in New York City.

The principle uses for which long-haul conveyor belts have been employed up to the present are in coal and ore mining and the removal of earth materials from one site to another. In building the Shasta Dam in California some 12,000,000 tons of sand and gravel for masonry construction were transported nearly ten miles from pit to dam site over country too rough for economical cartage by rail or highway.

This belt, traveling like others over rollers in a supporting framework, followed the direct route from pit to the site of the dam. It traveled up and down heavy mountain grades, crossed highways and railroads on steel trestles, and dumped at its terminal each hour about as much material as 600 five-ton trucks could have delivered in the same length of time.

The belt used on the Shasta Dam project was a rubber-covered cotton conveyor. Actually a series of belts were used, one dumping its load into the next. This is necessary because of the mechanical difficulties of operating a single long belt. Rubber-coated cotton belting, unless of impractical thickness, is not strong enough in great lengths to withstand when loaded the "pull" of the powered head and tail pulleys at the ends.

For more permanent installations belts with steel cable interwoven in them are available. These have far greater strength and permit the use of longer belts. But they are far more costly than the rubber-coated cotton type. To help the latter, intermediate rollers are sometimes powered. Such rollers are equipped with vacuum cups to give a pulling grip on the loaded belt passing over them.

Rollers for belts on which loose material is carried, such as earth and coal, are arranged in spool-shape so that they turn up the edges of the belt to keep the contents from spilling from the sides. The rollers may be made up of a number of wheels on the same axial, and in certain cases rubber tired wheels are used.

A belt one yard wide carries about a ton of coal on each 45 feet of length, or two tons of crushed rock on the same length. If traveling at a rate of 450 feet a minute such a belt could deliver 600 tons of coal an hour, or about 14,400 tons in a 24-hour day.

The cost of belting and its installation for long-hauls is high, but the cost of maintenance and operation is low. Where a considerable amount of material is to be moved, belt transportation is claimed to be the lowest costing method now in use. Also belts are transferable, and when one job is completed can be used on another.

Part of the belt used on the Shasta Dam was later used in carrying fill to the Anderson Dam in Idaho. There it moved more than 8,000,000 tons of clay two miles to form the core of the world's highest earthen dam. This conveyor cotton-rubber was still in good condition.

One great advantage of belt conveyors is that they are suitable in very rough country where other forms of transportation would be very difficult. They can run up and down grades at least 30 per cent, many times greater than can be used by trucks or ordinary railways. They can cross chasms, rivers, highways and railroads on relatively inexpensive narrow bridges because their loaded weight per linear foot is low. Where tunnel-

ing is used to avoid crossing high ridges, only a relatively small bore tunnel is necessary.

Another advantage is that loaded belts passing down steep grades can be used to operate regenerative motors to develop power for use on other parts of the line, or for other purposes. On the Anderson [illegible], for instance, the downhill runs of loaded lines kept the belt running and also furnished electric power to light night-time work and power electric shovels.

Cotton duck, in one or several layers bonded and covered with rubber, is used in ordinary conveyor belts. Belts of high strength, however, are made of steel cables embedded in rubber. Such belts are used where a single long belt is desirable, instead of a series. This is the case in bringing coal and ore from mines to the surface. With steel cable belts it is possible on a horizontal profile to operate one endless belt six miles or more from head pulley to tail pulley.

In the development of satisfactory steel cable conveyor belts much research work was required. The steel used must have strength and long life but particularly be extremely flexible so that it passes easily over the head and tail pulleys. The cables now used are of the finely-stranded airplane type. They are sometimes plated with brass to provide a surface to which the rubber covering will cling.

Conveyor belts are now widely used in coal mining and even wider usage is predicted for the future. Feeder belts carry the coal from working faces to a central belt. This brings the coal to the foot of a sloping belt that extends up a tunnel to the surface. The coal comes to the surface in a constant stream. Operation of the belt system is claimed to be cheaper than by underground railway cars drawn by special locomotives and to present less hazards than other forms of transportation.

What the future has in store for belt conveyors can not be predicted but several projects have been proposed for their uses on hauls of far greater length than any used in the past or now in use. Included is a 100-mile belt in Ohio. It would extend from Lorraine on Lake Erie to a point on the Ohio River. It would haul iron ore unloaded from boats on the Great Lakes to inland smelters. It would also bring coal from Ohio mines to the Lake Erie port for local use or for shipment by the iron-ore vessels to distant ports on the Lakes. It would provide cheaper transportation than now is provided by railroads.

Whether or not this 100-mile conveyor belt will be constructed or not remains a question. The railroads with which it would compete are reported to be fighting it. They are said to be afraid of the lower transportation costs that the belt would provide. On the whole, railroads have little to fear by competition from belt conveyors because this latter type of cargo carrier is not suitable for general merchandise but each conveyor must be built for a particular product. In this case the proposed belt would carry only ore and coal and the same belt could carry these two products.

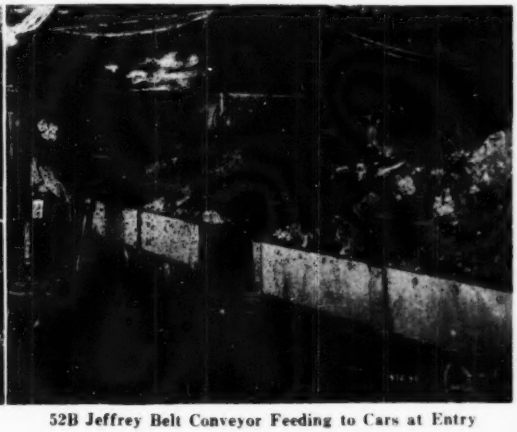
Another novel proposed use for a conveyor belt is in New York City to replace the present subway shuttle trains that transfer passengers between Grand Central Station and Times Square. This shuttle replacement plan, already submitted to the New York Board of Transportation, would provide small, closely spaced passenger cars riding on an endless track of rubber conveyor belts and rubber-tired banks of accelerator wheels.

At the ends of the route, where the cars would pass around a circular terminal, would be placed moving platforms for loading and unloading on to which passengers can step from moving cars or platforms. The small cars, with seats, would pass around the circular terminal at the same rate of speed as the moving platform. After loading and passing beyond the loading platform, the cars would move over pneumatic tire wheels which speed them up and carry them onto another conveyor belt of higher speed.

The moving platforms at the terminals would travel at a speed of about one and one-half miles per hour, half the usual pedestrian pace. Between loading points the cars would travel at 15 miles an hour. The cars are turned around at either end on rollers by a large wheel and return in the opposite direction on the endless track.

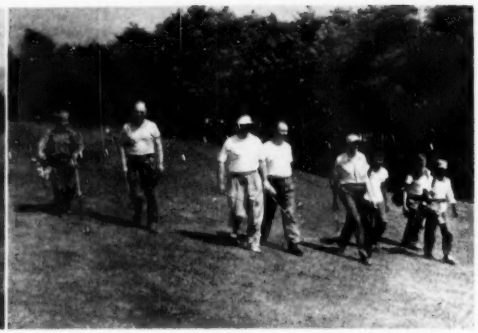
Advantages claimed for this proposed conveyor-belt transportation system is ability to relieve rush hour congestion by its peak load capacity of 32,000 passengers per hour in each direction and delivering passengers from platform to platform in two minutes, compared with the three minutes now required by shuttle trains. Operating costs of the new system would be less than one-half of the present operating cost of the shuttle at peak load, the designers estimate.

Jeffrey Room Conveyors Feeding to 52B Belt



52B Jeffrey Belt Conveyor Feeding to Cars at Entry

Left to right: H. O. Draper, Asst. to Mgr. Mines, Jones & Laughlin Steel Corp., Herb Lipton, Mark Simpson and E. R. Cooper, Mgr. Mines, Jones & Laughlin Steel Corp.



At the Uniontown Country Club. Left: Sandy Grant, Gen. Mgr. Mines, Youngstown Sheet & Tube Co., Andy Howard, National Battery Corp., Fred Colley, Penn Machine Co., and Kenneth Bartlette, Bethlehem Mines Corp.

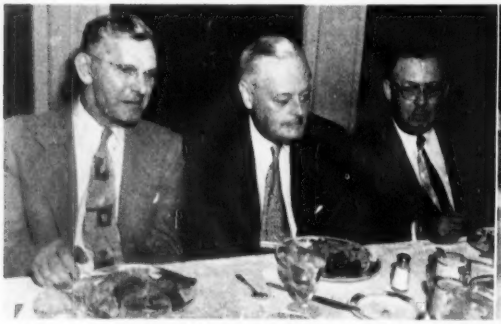
# Meetings of the Western Pennsylvania Coal Operators Association

The Western Pennsylvania Coal Operators Golf Association opened its 1952 playing season May 15 at the Nemacolin Country Club, near Brownsville, Pennsylvania. This group is gathering every three weeks this year and four meetings have been held so far — 2 at Nemacolin club and 2 at the Uniontown club. Coming meetings will be held August 7 at the Greene Country Club, August 21 at the Monongahela Country Club, September 18 at the Uniontown Country Club and October 9 at the Nemacolin Country Club.

Attendance by coal operators and their friends has been as good as in previous years and good times have been had by all, but there has been no indication of a movement to turn these gatherings of influencial coal mining and mine equipment manufacturing men to important useful purposes.

Two years ago there was great interest in techonological advancement in our industry. Research conciousness permiated the industry everywhere. Today, however, we seem to be back in the old rut, contending ourselves with what we now have. The trouble appears to be lact of research.

Our previous show of life toward research has stimulated that type of work in our colleges and universities. Following is a report by the Engineering College Research Council which points out the possibilities of obtaining research personnel that was lacking when we first became enthusiastic over continuous mining.



Left to right: J. H. Reitz, Dist. Mgr. Mines, Republic Steel Corp., Ed Vant, Jeffrey Mfg. Co., and J. N. Hedding, Gen. Supt. of Mines for the Republic Steel Corp.

Left: M. D. Cooper, National Coal Asso., Ray Uddstrom, Rome Cable Corp., Jack Kite, Mosebach Electric Co., W. E. Hess, Gen. Supt. Mines, Jones & Laughlin Steel Corp.

Ray Werner, Harris Pump & Supply Co. and Nicolla Borzella, Chief Engineer, Mining Division, Jones & Laughlin Steel Corp.

Left: Charles Myers, Mine Safety Appliances Co. Second from right is Kesneth Bartlett, Bethlehem Mines Corp., and J. P. Howell, Jeffrey Manufacturing Co.

The increasing research-consciousness of the American coal industry is matched in the nation's colleges and universities, where teaching programs have generated substantial resources for fundamental research in coal mining and solid fuels problems.

The industry has already turned to college and university faculties for help in answering some of its problems. Yet a considerable reserve of part-time research talent in mining and fuels engineering is still on tap in American educational institutions.

A survey in mid-1951 by the Engineering College Research Council shows that 128 college faculty members are considered qualified to do research in mining engineering. Only 82 have any research underway; they average about half-time on their research projects.

At 65 colleges and universities, where nearly 200 faculty members are qualified to do research in the fuels engineering field, few more than 100 teachers have research underway.

Left: C. W. Connor, Jr., U. S. S. Co. Frick Div., J. P. Howell, Pittsburgh Branch Mgr., Jeffrey Mfg. Co., J. J. Hofman, Raybestos Manhattan Rubber Co., J. M. Krese, Republic Steel Corp., E. F. Charlton, Connellsville Mfg. & Mine Supply Co.

In the more familiar fields of chemical engineering and geology, too, college and university research talent remains available to be pointed toward the coal industry's needs. There are 150 chemical engineers and 400 geologists ready to do research who have no projects underway.

These figures come from a national inventory of college and university research resources completed in 1951 by the Engineering College Research Council, a unit of the American Society for Engineering Education. The study was made by the Council's Committee on Relations with Military Research Ag-

Left: Dale Miller, Crucible Fuel Co., Charles Farnsworth, Engineer and Torrence Stiffler, President of the Stiffler Industrial Lubricants Co.

Left: T. C. Mathiott, Gen. Pur. Agent for the P. & L. E. Railroad, H. L. Williams, Victoria Coal Co., Paul J. Schweiburg, Gen. Coal Freight Agent for the New York Central Railroad.

Max Lambert, Hewitt Rubber Co. of Pittsburgh, L. O. Lougee, Chief Engineer, Baton Coal Co., Woody Johnson, of R. G. Johnson Co.

J. A. Henry and J. C. Bortz of the Bortz Coal Co., H. J. Lang, Industrial Electric Co., and Howard Miller, Master Mechanic, Crucible Fuel Co.

encies[1], at the request and with the active cooperation of the Research and Development Board, Office of the Secretary of Defense.

The Research Council survey covered the special interests and activities of faculty and graduate students in all physical and engineering sciences at 750 colleges and universities in the United States. Forty-two schools reported one or more faculty members qualified for mining engineering research; twenty-six showed at least two faculty and several graduate students.

The Committee believes, according to Dean A. F. Spilhaus of the University of Minnesota, Chairman, that "substantially all" of the national potential for research in educational institutions is reported.

Prize winners receiving their prizes at the Uniontown club. Dick Johnson, Mine Safety Appliances Co. giving out the prizes.

The results, in summary, show:

- Nearly 25,000 faculty members in all physical and engineering sciences.
- Of these, 20,000 are considered qualified for research.
- At least 12,700 of these are now active in research.
- An average of 27% of all faculty time is spent on research.
- At least 45% of this research time is now devoted to defense projects, sponsored by military agencies or their contractors.

### Room for Expansion

The Engineering College Research Council's figures show 135.5 faculty members and full-time senior research personnel in mining engineering in 42 schools. Of these, 128.5 are judged qualified to undertake research projects, and 82 of them are now engaged in research. This effort is equivalent to the

[1]Members of the Committee are: Dean A. F. Spilhaus University of Minnesota, chairman; Dr. A. P. Colburn, University of Delaware; Dean W. L. Everitt, University of Illinois; Professor F. B. Farquharson, University of Washington; Professor C. W. Good, University of Michigan; Dr. Paul E. Klopsteg, Northwestern University; President J. R. VanPelt, Montana School of Mines; and Dean Eric A. Walker, Pennsylvania State College. Dr. Gerald A. Rosselot, Georgia Institute of Technology, is Chairman of the Council.

Left: Bill McMullin, Sales representative, George L. Wilson & Co.; W. S. Mawhenny, Manufacturers Representative; G. W. Hutchinson, Manufactures Representative.

Left: Harold Lusk, Manufacturers representative, Elliott Williams, Hartley-Rose Co., J. C. Durfee, A. B. Crane, Philadelphia, Pa.

work of a full-time research staff of 44.4, and of these "equivalents" 11 would be engaged in defense projects for military agencies or their contractors.

There are 129 graduate students and assistants now doing mining engineering research, and their work is equivalent to that of 50 full-time staff members.

Only 64% of the qualified senior faculty members in mining engineering are now engaged in research. The 36 teachers in this field who do not have project underway can be expected to welcome suggestions and support for part-time studies.

Mining engineers number only 0.54% of the physical and engineering scientists in colleges and universities; they are doing 0.66% of all research in these fields in academic laboratories.

More research resources remain available in the fuels engineering catagory. According to the survey figures, there are 209 faculty members in fuels engineering, of whom 195 at 65 schools are qualified to do research. Only 112 of them now have studies in progress, doing work equivalent to a full-time research staff of 72.7. Of these "equivalents," 12.5 are on defense projects.

In chemical engineering, the figures show 701 qualified faculty members of whom 564 are already engaged in research. There are 1322 qualified faculty members in the earth sciences classifications—including geologists, oceangraphers, and meteorologists—and 964 of them already have projects underway.

The coal industry apparently faces little competition from federal defense agencies in using these resources. Defense research accounts for only 17% of the fuels projects reported by colleges and universities—the lowest proportion of any of the engineering and physical sciences surveyed. And the mining engineers reported only 25% of their research sponsored by defense agencies. By contrast, in some fields defense studies are absorbing up to 80% of college and university research time.

### Broad Interests Represented

This college research manpower has broad interests. Here are the numbers of schools reporting qualified fields of mining and fuels engineering:

**Mining engineering:**

| | |
|---|---|
| Surface mine exploration and development | 25 |
| Underground mine exploration and development | 24 |
| Mine operation and engineering | 27 |
| Mineral preparation and processing | 31 |
| Mine safety and ventilation | 20 |
| Non-metalic minerals and quarries | 17 |

**Fuels engineering:**

| | |
|---|---|
| Coal and solid fuels | 38 |
| Combustion reactions | 41 |
| Fuel processing and utilization | 29 |
| Gaseous fuels | 36 |
| Liquid fuels | 50 |
| Lubricants | 36 |
| Petroleum by-products and derivatives | 29 |
| Rocket fuels | 18 |
| Synthetic fuels and lubricants | 22 |

**Earth Sciences:**

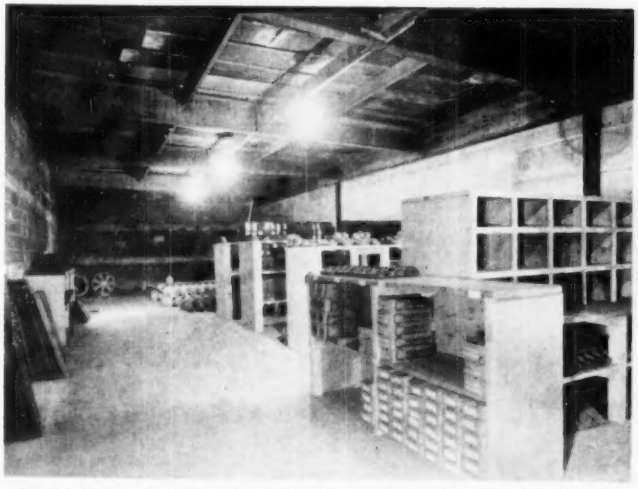
| | |
|---|---|
| Economic geology | 175 |
| Mineralogy | 142 |
| Prospecting and ore analysis | 70 |

No one proposes that all these schools have equal competence in each field. Potential research sponsors will still have to ponder individual schools' accomplishments and facilities befort writing contracts.

Teaching properly takes precedence over research in all educational institutions, and research is considered valuable especially for its contribution to effective education. Within these limits, the Research Council's figures seem to show a considerable potential in colleges to met growing research commitments to the coal industry.

*The full report of the survey, entitled "University Research Potential", identifies all schools reporting personnel, competencies, and equipment. Copies are available from the Engineering College Research Council at Room 7-204, 77 Massachusetts Avenue, Cambridge 39, Massachusetts, at $1.00 each.

Looking at the new Fageol heat machine which has recently been placed on the industrial market. Left: A. C. Palm, president, Palm & Patterson, Inc., Cleveland Advertising Agency. Center: R. H. Randolph, General Sales Director, Fageol Heat Machine Company. Right: J. W. Merydith, Assistant Sales Manager, Fageol Heat Machine Company.



Interior view of the new Weirton, W. Va., branch warehouse of the Kanawha Steel & Equipment Co.

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# Coal Strippers Meet

The Mineral Producers Association, an organization of coal strippers of western Pennsylvania, held its annual meeting at Pittsburgh June 12. Speaker at the banquet was Eugene Ayres, of Gulf Research & Development Co., Pittsburgh.

1. Jay Bryan, Tri County Fuel Co., Boyers; James C. Anderson, Carbon Coal Co., Butler; A. W. Neillie, Tri County Fuel Co., Youngstown, O.; W. C. Altvater, Pittsburgh & Shawmut Coal Co., Kitanning.

2. Matthew A. Crawford, assn. counsel, Kitanning; Emil Lefkof, State Department of Forests & Waters, Harrisburg; Walter Schulter, Pittsburgh Consolidated Coal Co., Imperial; William McBride, Jefferson Coal & Coke Co., Burgettstown; Richard Maize, secretary of state Department of Mines, Harrisburg; Eugene Ayres, Gulf Research & Development Co., Pittsburgh.

3. C. E. McGlaughlin, Bituminous Coal Research, Inc., Pittsburgh; Ray S. Walker, vice-president of the association, John P. Kelley and Allen Butler, all with Bradford Coal Co.

4. William C. Schmid, Boyles Coal & Supply Co., New Castle; Russell R. Tryee, Rochester & Pittsburgh Coal Co., Indiana; Charles Pope, DuPont Co., Indiana; Myron Shaffer, Maral Co., Kittanning; R. R. Bowie, Bowie Coal Co., Grove City, and association president.

5. Harry D. Ford, Ford & Gaskill, Masontown; W. A. McBride; W. H. McNeal, Coal Age; William Harger, Sunbeam Coal Corp., North Washington; A. D. Grasso, Grasso Coal Mining Co., Brockway.

6. L. S. Taylor, Ernest Petruzzi, Grasso Coal Co.; G. E. Vaughn, Pennsylvania Railroad, Wilkensburg; G. R. Vaughn, R. L. Vaughn, Grasso Coal Co., Brockway.

7. Carmen Ambrosia, Ambrosia Coal Co., New Castle; E. N. Boyles, Paul R. Boyles, Earl Miller and William Schmid, Boyles Coal & Supply Co., New Castle.

8. John O'Neal, A. A. Guydosh, American Cynamid Co., Pittsburgh; M. J. Rea, R. O. Murphy, Allison Engineering Co., Foxburg; Ches Amick, Jr., Allied Equipment Corp., Carnegie.

9. Hugh Cameron, Beckwith Machinery Co., Pittsburgh; Richard Meloni, Pete Tedoldi, Oscar Meloni, Denis Taddia, Wells Coal Co., St. Clairsville; Duane Snyder, Beckwith Machinery Co.

10. Clifford Turner, Bowie Coal Co., Grove City; John Ziras, John Ziras Co., East Brady; Paul Turner, Bowie Coal Co. Claud Meadows, Sunbeam Coal Co., North Washington.

11. John M. Aiken, Atlas Powder Co., Grove City; T. P. McCarthy, Beckwith Machinery Co., Pittsburgh; G. E. Grazer, Nelson Bourgeois, Rimersburg Coal Co., Rimersburg; Robert Nesbit, L. B. Smith, Inc., Camp Hill; L. E. Samuelson, Beckwith Machinery Co.; W. L. McMullin, George L. Wilson & Co., Pittsburgh.

12. J. D. Whalen, Greensburgh-Connellsville Coal Co., Pittsburgh; William B. Bannister, Pittsburgh Consolidated Coal Co., Imperial; Ben Davis, Davis Coal Co.; Harry Craig Bros. Coal Co., Robert McIlroth, insurance broker, Pittsburgh; H. Elmer Whitmyre, A. T. Green Machinery Co., Pittsburgh.

13. Lou Lenz, Highway Equipment Co., Pittsburgh; Harold Clark, Harrisburg, Gar Wood Industries, Inc.; Lee Reynolds, Al Dalessio, Highway Equipment Co.

14. Frank Patterson, John Snyder, Merle Urey, Bowie Coal Co., Grove City; William Dickey, Beckwith Machinery Co.

15. C. J. Lindstrom, Buckeye Coal Co., Jackson Center; Ira Wood, Wood Coal Mining Co., Tarentum; Walter Condren, G. E. Dussinger, Beckwith Machinery Co.

16. W. B. Bannister, Pittsburgh Coal Co.; Imperial; B. H. Canon, retired member of operators association; Roy Cann, Domestic Coal Co., Stoneboro; standing Russ Lammert, Fred Fagerstrom, Anderson Equipment Co., Pittsbugh; R. R. Bowie, Bowie Coal Co.

17. J. I. Whalley, Beechnut Coal Co., Windber; John Vickroy, G. W. Vickroy, Carbon Coal Co.,Grove City.

18. John Chutz, Charles L. Smith, Mac Chutz, Chutz Bros. Coal Co., Slippery Rock.

19. W. T. Good, Coal Hill Mining Co., DuBois; G. E. Turner, N. E. Bourgeois, Rimersburgh Coal Co., Rimersburg.

W. E. Corbett, Master Mech. Saginaw Dock & Terminal Corp. and Chairman of Programs MEMMA, E. W. Wirtmire, V-Pres. The Columbia-Southern Chemical Corp. and Herb Lewis, Pres. Lewis Electrical Mfg. Co. and principle speaker of the evening.

S. E. Gane, S. E. Gane & Co., E. E. Gaston, Electrical Eng. Hanna Coal Co., Henry J. Miller, Electrician, Windsor Power House Coal Co.

# Ohio Branch of the Mining Electro-Mechanical Maintenance Association Is Organized

The Ohio branch of the Mining Electro-Mechanical Association has been organized and is having regular meeting with a good attendance. This group is composed of mining men from mines in Ohio and in the Panhandle region of West Virginia.

R. E. Soffell, Chief Electrician, Frank A. Ferkol, Mech. R. W. Holstein, Mech., Taylor V. Johnson, U. S. Bureau of Mines.

John Knight, Master Mech., Chas. Heidelbach, Safety Director, Robt. Frodle Outside For. all with Powhatan Min-equipment operations, Hanna Coal Co.

Monroe Mechling, Safety Director, Valley Camp Coal Co. W. J. Schuster, Safety Director, Hanna Coal Co., W. G. Boes, Application Eng., Westinghouse Electric Corp., J. C. Beck, Ind. Power Eng., The Ohio Power Co.

Don Couch, Safety Eng., Hanna Coal Co.; J. C. Eakins, Federal Inspector, M. L. Davis, Chief, St. Clairsville, Ohio Section, U. S. Bureau of Mines, Walter Conklin, Shop For., Valley Camp Coal Co.

Geo. Bartohovich, For., Powhatan Mining Co., C. R. Young, Surveyor and Pollack, Electrician, both with the Columbia-Southern Chemical Corp., Midvale Mine .

D. R. Dunham, Eng., W. M. Provan, Gen. Mine For., A. S. Milarcik, Supt., C. A. Schlafly, Electrician, all with the Columbia-Southern Chemical Corp. Midvale, Mine.

Andy Tylke, Mech., Nelson Meese, Mech., Fred Bierie, Mech., all from the Midvale, Ohio coal mine of the Columbia-Southern Chemical Corp.

Left: S. H. Repport, Cambria Mining Co. and Branch rep. for the MEMMA, John Douglas, Safety Eng., Hanna Coal Co., Tom Durbin, Master Mech., Hanna Coal Co.

Mike Duda, Master Mech., Dean Love, Maintenance For., Ewalt Herzog, Safety Director, John E. Merryman, Safety Director.

Left: Wetzel Spry, Production Foreman, A. M. Newcomer, Electrical Eng., Valley Camp Coal Co., C. L. Serff, Preparation Foreman and R. V. Bonenizer, Georgetown Preparation Plant Gen. Maint. Foreman, Hanna Coal Co.

• A patent on Rusco Fused Fabric brake lining was issued to Russell Manufacturing Company, Middletown, Connecticut on February 2, 1952. The patent number is 2,584,-825.

The patent discloses that the company has developed a completely new method of manufacturing brake lining. Strands of asbestos web are saturated and completely surrounded with a special frictional binder material. This mass is compressed under 300 tons of pressure effecting a density of 120 pounds per cubic foot, with a tensile strength nearly ten times that of conventional woven brake lining.

The result is a quality brake lining with uniform structure throughout, with uniform coefficient of friction, with uniform rate of wear and a distinctive appearance during the whole life of the lining.

Because of its greater density and tensile strength, it is claimed that Rusco Fused Fabric brake lining will not absorb water. Frictional heat evaporates surface moisture, allowing almost immediate braking recovery. Grabbing and fade are reduced to a minimum.

The patent was granted to Gustav Walters, vice president and director of research, and H. Clifford Morton, assistant director, and assigned to Russel Manufacturing Company.

• A home-made pinning machine solved a difficult problem for the P. & M. Coal Company, which is mining a 20-inch coal vein near Columbus, Kansas. Shallow blasting would have been dangerous and might pulverize the coal beyond practical use.

To break up the vein without shattering too much coal, P. & M. devised a pinning machine, which uses a 4,800-lb. weight to drive a 10-inch steel peen, into the shale at 30-inch intervals. A Caterpillar Diesel RD7 Tractor pulls and powers the machine.

The coal vein is underneath an overburden averaging 30 feet; each pit is approximately 90 feet wide and ½-mile long. A home-built drilling rig drills a 5½" hole 36' deep so sand rock can be blasted. Equipped with a Coalmaster auger, the rig drills 10 to 12 holes in eight hours. Other equipment includes two horizontal McCarthy 5½" drills.

Overburden is stripped on a 24-hour basis by a large electric-powered Bucyrus-Erie Model 950B shovel with a 33-yard bucket and a Model 10W Monigan Dragline.

A Caterpillar Diesel D7 Tractor, equipped with a No 7A Bulldozer, cleans dirt from the top of the coal vein before the pinning. Following the pinning machine, a Bucyrus-Erie 38B Shovel and a six-ton capacity Thrust Loader work a full 7½-hour day filling Dart trailers. These 40-ton capacity units make a 5-mile round trip from the mine to the tipple.

The coal, which is marketed in Illinois, Nebraska, Kansas, and Missouri, is washed and graded to specifications as mill coal, stoker, lump and nut coal. The cleaning plant averages 2,200 tons in 7½ hours. Three 15-ton Dart trucks haul waste from the tipple.

Development of Caterpillar earthmovers continues with the announcement of a new No. 60 Scraper for use with D6 Tractor power.

The new unit has a flat-bottom bowl and stinger blade engineered for loading and finishing characteristics. The reversible blade cuts a 7 ft. 8 in. swath; the bottom is double with steel beam fillers.

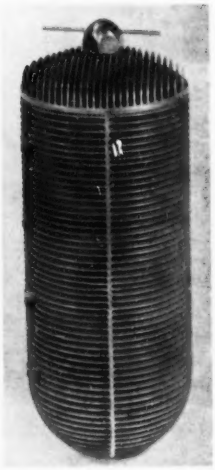
Capacity of the No. 60 has been increased to 7 cu. yds. struck and 9 cu. yds. heaped. Top extensions or sideboards are available to boost this capacity to 8.3 cu. yds. struck and 11.5 cu. yds. heaped. Maximum carrying capacity is 11.5 tons.

Also included are such design details as an unobstructed bowl, tapered roller bearings at the axles, induction hardened sheaves and bulldozer-type ejection. Operation is by means of a Cat Cable Control available for attachment to the tractor.

• The J-B-Engineering Company of Los Angeles. California, announces the development of an oil-heat-exchanger and oil-clarifier as a combined integral unit which has from both an engineering standpoint and the viewpoint of the operator-owner met with considerable success in preventing many of the undesirable mechanical conditions as are now encountered by the operators of diesel powered equipment.

The exchanger will be marketed in a size which is optimun for the entire field of diesel powered equipment. The unit has an O. D. of 10 inches and measures just under 30 inches in overall length. The unit is completely finned, and is designed to present the immense surface area of approximately nineteen-hundred (1900) square inches for the disipation of excessive temperatures that prevail in the body of the lubrication oil. the rate of heat exchange being approximately five-thousand (5000) BTU's per square foot exposed at room temperature with no air circulation.

Che J-B unit encompasses a replaceable filter element which is unique in design and which tests determine to give in excess of fifty percent greater service than other filters of comparable size. The element consists of a fibrous media, a pure white celleous which will



filter down to two to four microns. In operation it can safely be stated that the element will filter out particals of five micro, and will store within the filter media all contaminents of the oil which flows through the filter. This special fibrous media is carefully weighed and wound in convolutions upon a steel core thus affording many laminations of media which has the effect of multi-element protection, thus affording the user the assurance of excellent filtration without fear of channeling and with the knowledge that the status of his compounded oil will be maintained at the exact specification afforded by the oil refinery.

---

• A new line of chromate anti-rust paints to be marketed under the trade name "Overust" is announced by Chem Industrial Co., Brooklyn 9, Ohio.

These new paints feature a high quality Menhaden Vegetable Oil base with special chromate pigments added to give extra protection against rust, the manufacturer states. They are reputed to provide a much greater degree of protection against rust than previously available protective coatings.

Available in red, gray, green, black, aluminum and clear, the new Overust chromate paints are recommended for use on any kind of metal, interior or exterior. According to the manufacturer, these paints can be applied directly over rusted surfaces without wire brushing of sandblasting, and one coat is sufficient to prime, penetrate and seal all metal surfaces. Chromates in Overust paints possess great affinity for metal and are reputed to stop the most severe rust attacks and to resist moisture, temperature changes, chemicals, acids and fumes. They can be applied by either brush or spray.

Where colored anti-rust paints are desired, Overust can be used without the customary colorless primer coat which is required for ordinary colored paints. Overust Clear can be used as a first coat prior to the application of any desired type of other paint (except lacquer).

Write for information to Chem Industrial Co., 3784 Ridge Road, Brooklyn 9, Ohio.

• "Your Voice of Action" is the title of a newly released 6 page brochure describing and offering the Femco Trolleyphone, new plug-in model—2550 series.

Femco Trolleyphones provide low cost communication wherever existing wires can be utilized. Power is taken directly from trolley wire or power line. The new plug-in model has been made more compact, and vastly easier to install and service than all previous models of similar equipment.

Ask for Bulletin No. 25. Copies will be sent on request by manufacturer: Farmers Engineering and Manufacturing Company, 549 Brushton Ave., Pittsburgh 21, Pa.

---

• A new 4-page bulletin descriptive of all types of 105 c.f.m. Davey Compressors, is announced by Davey Compressor Co., Kent, Ohio.

Davey gasoline, diesel and electric-powered trailers; "Auto-Air" truck-mounted units and industrial stationary machines are listed and illustrated in detail. Complete mechanical specifications are included in a handy reference table.

For bulletin copies, write Davey Compressor Co., Kent, Ohio. Ask for Form E-237.

•

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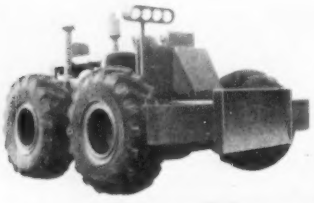
• A new pusher unit, called the Tournatractor, for contractors who are using dozers exclusively as pushers is being offered by R. G. LeTourneau, Inc., Peoria, Illinois manufacturer of heavy construction and lifting equipment.

The pusher is a new version of the Super C Tournadozer with the dozer blade, power control unit, A-frame and dozer controls omitted. In place of these is a massive billet, 3"x15" and spanning the width of the machine. On the billet the manufacturer has placed a large pusher plate.



The Tournatractor can be equipped with a torque-converter as original equipment and is equally adaptable to pulling operations, either with a rear power control unit or with its drawbar alone. If later the need for a dozer developes the billet and pusher plate can easily be removed and the A-frame, power control and dozer added.

The Tournatractor is offered with a variety of tire choices to meet various job conditions. The manufacturer recommends either the 21.00x25 or 18.00x25 size tires for operations in clay, rock or muddy conditions, where an aggressive high traction tire is desired and the 65" wide-base tires for operations in loose sandy material.

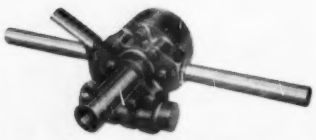
---

• Schroeder Brothers, 3116 Penn Avenue, Pittsburgh 1, Pennsylvania announce the development of the Schroeder Hydraulic Hand-Held Coal Drill.

The Drill had its first public showing at the Southern Appalachian Industrial Exhibit at Bluefield, West Virginia, May 14th, 15th and 16th where an operating display unit was shown.

The development of the Schroeder Drill is keyed to the increasing demands for the reduction of electrical explosion hazards and lower operating and maintenance costs in the Nation's coal industry.

The Schroeder Drill eliminates three major mining hazards: there is no electrical current in the drill



unit which might cause the explosion of gases or coal dust; the operator cannot be shocked by a faulty electrical circuit in the drill or drill cable; unlike an electric hand-held coal drill, the Schroeder Drill cannot "kick" or throw the operator.

High speed, light weight and low maintenance are the other advantages of the Schroeder Drill. With little more than ½ the weight of comparable electric coal drills, this unit drills up to three times as fast. In one case 8 foot holes, 3 inches in diameter have been drilled in 12 seconds. With all these advantages, maintenance of pilot units has been extremely low, showing definite savings over other types of coal drills.

Hydraulic power for the Schroeder Drill is usually "robbed" from the hydraulic system of universal coal cutting machines common in bituminous coal mines. The cutting machine operators then perform both cutting and drilling operations.

The cost of the Schroeder Drill is below that of comparable electric coal drills.

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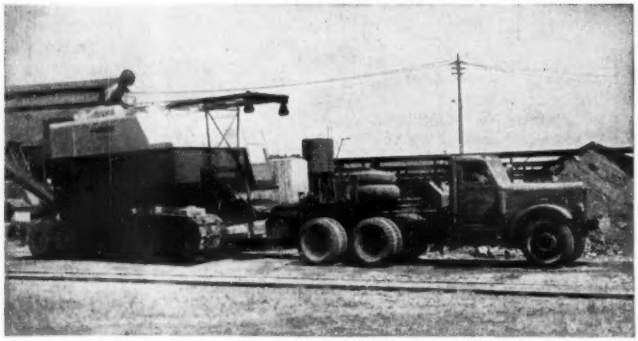

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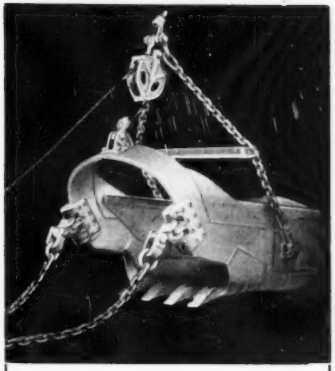

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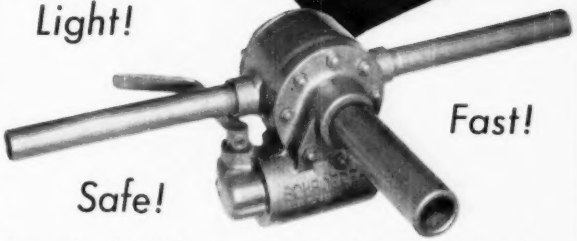

Powered from the hydraulic power system of standard mining equipment, the Schroeder 12-B Coal Drill provides plenty of power for fast drilling with complete operational safety—never any spark, kick, or shock—all electrical hazards are removed yards from the drill! Lightweight and dependable, its design simplicity and minimum of parts result in greatly reduced maintenance costs. Write or call for details and demonstration.

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● Five new titanium alloys, which promise to make the new wonder metal still stronger, were patented.

They were assigned to the Remington Arms Company, Bridgeport, Conn., whose subsidiary, Rem-Cru Titanium, Inc., is the chief manufacturer of titanium and titanium alloy products. Pure titanium weighs about half as much as steel, yet is twice as strong as many steels. Although it weighs twice as much as aluminum it is three times as strong.

However, by making a proper titanium alloy, the strength of the metal can be doubled. Four of the patents have to do with adding specific materials to a titanium-aluminum alloy. The materials are antimony, bismuth, boron and indium. The patents claim in each case that addition of these materials results in a marked improvement in the properties of the titanium-aluminum alloy. These alloys, the inventors say, "show a rare combination of extraordinary strength with adequate ductility."

The fifth patent is for a quaternary alloy of titanium with aluminum, chromium and molybdenum. The presence of small amounts of carbon, with or without nitrogen or oxygen, or both, it was found, may be beneficial and not interfere with the ductile strength of the metal.

The inventors are Robert I. Jaffee, Horace R. Ogden and Daniel J. Maykuth, Columbus, Ohio, and the patents are numbered 2,596,485 through 2,596,489.

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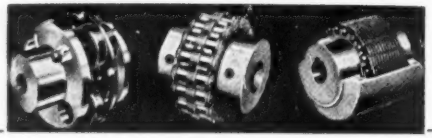

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| 1 | 100 | General Electric | 1800 |
| 1 | 100 | Reliance | 580 |
| 1 | 100 | Delco | 1200 |
| 2 | 90 | Westinghouse | 680 |
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| 1 | 125 | West. | 560 |
| 1 | 125 | Allis-Chal | 1150 |
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Agency—A. D. Walter, Inc.

Benkart & Sons Company, John ..... 8

Connellsville Manufacturing and Mine Supply Company ..... 28
Agency—McHenry-Derek Agency

Cummins Diesel Engine Co., Inc. ..... 2nd Cover
Agency—Needham, Louis & Brorby, Inc.

Daly Ticket Company ..... 25

Dravo-Doyle Co. ..... 4-5

Duquesne Electric & Manufacturing Company ..... 26

ESCO—Electric Steel Foundry ..... 3rd Cover

Euclid Road Machinery Co. ..... 7
Agency—Bayless-Kerr

Foster Company, Inc., L. B. ..... 26
Agency—Lando Advertising Agency

Furnival Machinery Co. ..... 4-5

Gane & Co., S. E. ..... 26

Greensburg Machine Company ..... 26

Hammond Company, J. V. ..... 28

Harris Pump & Supply Company ..... 8-28

Highway Equipment Company ..... 1st-4th Cover
Agency—Palm & Patterson, Inc.

Hoffman Bros. Drilling Co. ..... 28

Jeffrey Manufacturing Co. ..... 10-11
Agency—Byer & Bowman

Kanawha Steel & Equipment Co. ..... 3rd Cover

LeTourneau ..... 4-5
Agency—Arnold Andrews

McLanahan & Stone Corp. ..... 6
Agency—Walker & Downing, Industrial Division

McClure Equipment Company ..... 25

Midwest Steel Corporation ..... 26

Moore-Flesher Hauling Company ..... 24

Osgood Company ..... 27
Agency—Howard Swink Advertising Agency, Inc.

Penna. Drilling Co. ..... 28

Salem Tool Company, The ..... 1-26
Agency—Meek & Thomas, Inc.

Schroeder Bros. ..... 25
Agency—McHenry-Derek Advertising

Speco, Inc. ..... 26
Agency—Palm & Patterson, Inc.

Stanhope ..... 26

Statewide Equipment Co. ..... 4-5

Stiffler Industrial Lubricants Co. ..... 8

Tranter Mfg. Company ..... 26

Victor American Fuel Co. ..... 23

Wilson & Co., Geo. L. ..... 25



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Couplers and Head Blocks are 4, 5, and 6 inches in diameter. Please specify size when ordering. Poles are 1½ inches in diameter.

| | | |
|---|---|---|
| Head Blocks | 4" Dia. | $3.50 Ea. |
| Couplers | 4" Dia. | 3.90 Ea. |
| Poles 12 ft. long | 1½" Dia. | 3.60 Ea. |
| Poles 14 ft. long | 1½" Dia. | 4.20 Ea. |
| Poles 16 ft. long | 1½" Dia. | 4.80 Ea. |
| Poles 18 ft. long | 1½" Dia. | 6.30 Ea. |
| Poles 20 ft. long | 1½" Dia. | 7.00 Ea. |
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For **Tamping Explosive Shots:** Poles are round made of Hardwood. Sizes to 10 ft. long.

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| 1⅜" Dia. | 16c per lineal ft. |
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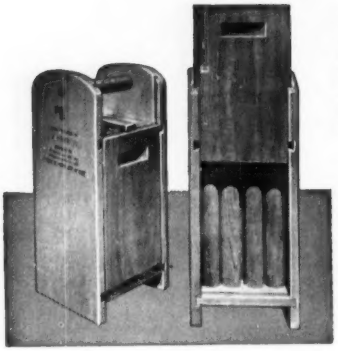
| 1¾" Dia. | 28c per lineal ft. |
| 2" Dia. | 32c per lineal ft. |

Special diameters and lengths can be furnished. These Poles meet the requirements of the New Federal Mine Safety Code.



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| No. 16 Powder Box | 3.45 Ea. | No. 50 Powder Box | 7.60 Ea. |
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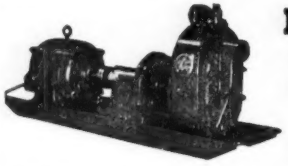

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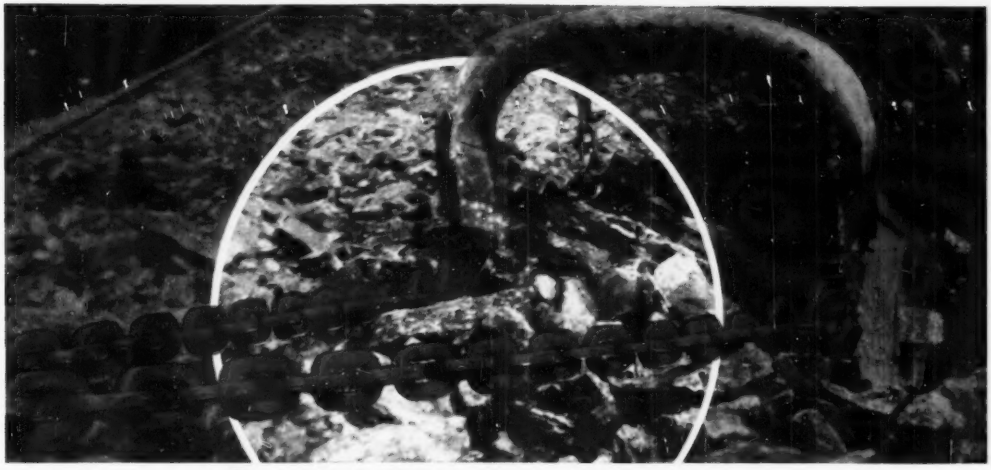
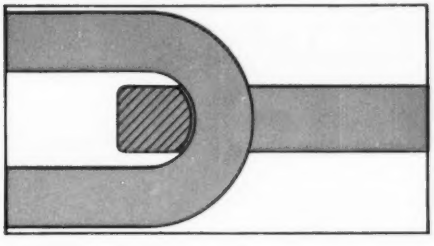


# ESCO DRAG CHAINS



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If you want more hours of service and lower costs per yard from your drag chains, here's your answer — *ESCO* chains which give you

**Solid cast links of work-hardening manganese steel, combining greatest toughness and shock resistance.**

**Oversize cross section area for longer wear.**

**More weight per foot for greater strength.**

Above: Shape of links distributes wear over large area, makes chains last longer.

Either end rings or pear links may be provided, depending upon owner's preference.

Dealers in all major cities stock *ESCO* drag chains in sizes from ¾" to 2¾". (They can provide drag chains for any make bucket.) For particulars on sizes and lengths ask your dealer for bulletin 108-J, "*ESCO* Dragline Bucket Fittings".

ESCO Dippers, Hoe Dippers, Dragline and Coal Loading Buckets

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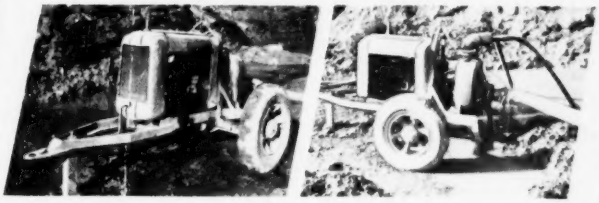

GILLELAND COAL CO., Uniontown . . . Allis-Chalmers HD-20 with Baker Hydraulic Bulldozer.

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